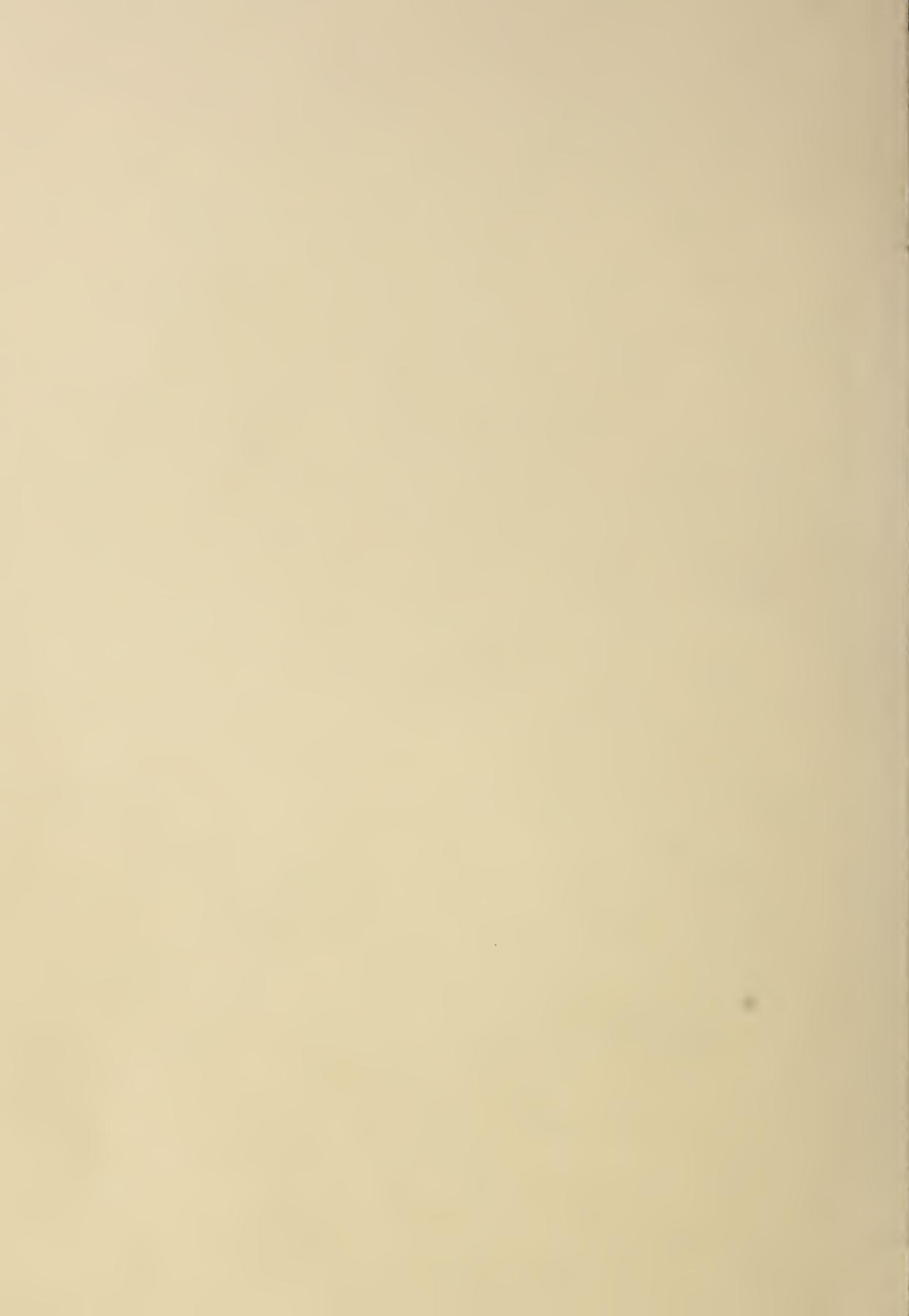


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THE INTRODUCTION AND SPREAD OF
HYBRID CORN IN ITALY //

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U. S. Foreign Agricultural Service
and
FOREIGN OPERATIONS ADMINISTRATION
Office of Food and Agriculture

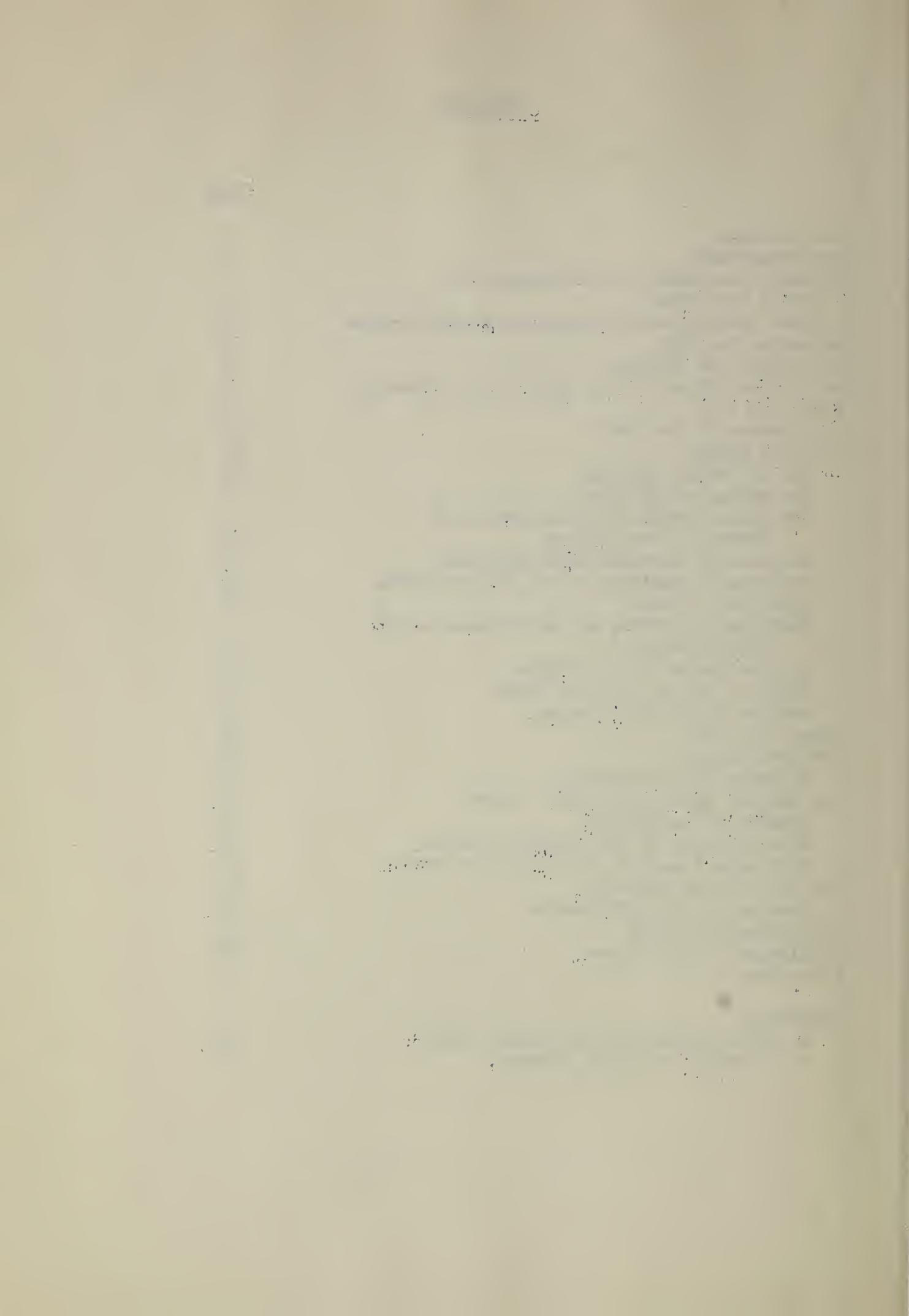
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THE INTRODUCTION AND SPREAD OF HYBRID CORN IN ITALY

Introduction

This is an account of the introduction and spread of hybrid corn in Italy. It is a story of a technical and economic assistance program and the problems and issues that were encountered in its implementation. Finally, and perhaps most importantly, it is a story of the successful cooperation of two friendly countries in pooling funds, personnel, and material to carry out a technical cooperation project.

The episode warrants the telling because it brings to the foreground many questions common to technical and economic assistance work: (1) What is the role of the foreign technician or administrator in a technical and economic assistance program? (2) how does one proceed to introduce a new technology into a foreign culture? (3) how important is the initial approach in the technical assistance process? (4) is the use of a subsidy an effective incentive in securing change? (5) how important is private enterprise in technical assistance work? and (6) does the success and rate of cultural change depend upon the type of new element being added to the culture?

In brief, the story is as follows: As the liberation of the various parts of Italy took place during World War II, Military Government officials of the Allied Armies were faced with the increasingly serious problem of finding food to feed the Italian population. It occurred to American agricultural members of Military Government that one possibility of substantially increasing Italy's food production capacity was through the introduction of hybrid corn. The implementation of this idea commenced under the auspices of the United Nations Rural Rehabilitation Administration (UNRRA) in 1946 and was continued by the Food and Agriculture Organization of the United Nations (FAO) during 1947. This was essentially a testing and experimentation period. This was followed by a large-scale demonstrational program on hundreds of Italian farms in 1948 with the importation of 50 tons of seed through the Interim Aid Program. 1/ Results of the 1948 demonstrations were so striking that the Economic Cooperation Administration (ECA) decided to make the hybrid corn project one of the cornerstones of its agricultural program in Italy and to push it vigorously. The account that follows covers the story of the introduction of hybrid seed corn into Italy from the beginning, but is focused primarily on the developments that took place with the coming of the ECA program in 1948. 2/

1/ This program was under the terms of the United States Foreign Aid Act of 1947 with special reference to Section 5(d) of Public Law 389.

2/ The Mutual Security Agency (MSA) succeeded the Economic Cooperation Administration in December 1951. For purposes of clarity and simplicity we will use "ECA" throughout this account.

The Background

Italy is basically agrarian. About 20 million people, nearly half of the population, strive to make a living from 20 million hectares of farm and pasture, much of which is hilly, mountainous or seasonally short of water. Nearly all the land suitable for crop production has long been in agricultural use. Under these circumstances it is evident that the pressure of the population upon the land is great, and there is great need to utilize every hectare of land and every gallon of water as efficiently as possible to feed the people of the country.

Despite the shortage of good agricultural soil, the farmers of Italy have managed to feed the population of the country with the assistance of imports of wheat and fat. Nutritionally, however, the diet has been considered inadequate in many respects. The consumption of cereals, for instance, has been particularly high whereas the consumption of meat products has been extremely low.

Corn has been and is one of the basic food and feed crops of Italy. It has been grown in all the regions of the country for a long period of time. In fact, Italy is one of the largest producers of corn on the European continent. ^{3/} It is widely used in Northern Italy in the form of a corn meal mush; the mush which is called "polenta" serves as a substitute for bread. In addition, corn is used for feeding livestock and for the needs of industry as the limited supply permits. The relatively low yields per hectare have prevented its more extensive use for livestock and industrial purposes. ^{4/} Production per hectare declined greatly during World War II due to the shortage of the fertilizer supply.

The advent of commercial hybrid maize production in the United States during the 1930's and the 1940's with its resulting 25 percent increase in corn production per acre had attracted little attention in Italy; yet it had not gone entirely unnoticed. Professor De Carolis, Inspector of Agriculture of the Province of Cremona (and Director of an experimental farm), had learned about the American hybrid corn program in 1936 while he was on a trip to the United States to buy Holstein breeding stock. As a result of his observations, Professor De Carolis made arrangements to secure some of the Wisconsin open-pollinated varieties of corn from the University of Wisconsin for trial purposes. The results of these tests were encouraging. According

^{3/} 1,300,000 - 1,500,000 hectares are usually planted to corn each year in Italy. A hectare is 2.4 acres. Yugoslavia, Rumania and European Russia are also large producers.

^{4/} The average yield in Northern Italy was formerly 24 quintals per hectare, 12 in Central Italy and 9 in Southern Italy. A quintal equals 100 kilograms or approximately 220 pounds.

to Italian reports, Professor De Carolis was the first person to recommend that Italy should develop a hybrid corn program. Inasmuch as De Carolis was not particularly interested in hybrids from a grain standpoint this phase of the testing gradually moved to the Institute of Maizeiculture at Bergamo under the direction of Professor T. V. Zapperoli.

The hybrid seed corn breeding project did not progress rapidly under Professor Zapperoli. He had been carrying on inbreeding work with flint corn for over 20 years, and this phase of his program continued to occupy most of his attention. With the coming of World War II resources of money, labor and equipment became extremely scarce and much of the research work of the Bergamo station came to a standstill. With his death in 1943, the small beginning of the hybrid corn breeding project in Italy came to a halt.

Military Government Re-Introduces the Hybrid Corn Idea

It is reported that "even before Northern Italy had been liberated by the Allied Armies it was evident to food and agriculture officers of Military Government that the Italian corn production could be increased through the introduction and diffusion in Italy of suitable American hybrid corn varieties."^{5/} Colonel William Hartman, Director of the Agricultural Sub-Commission of Allied Military Government in Italy, took three steps which have a bearing on our present story. ^{6/} First, he secured money from the United States Army in Italy to finance the operations of the Corn Experiment Station at Bergamo on a temporary basis until the Italian Ministry of Agriculture could provide funds for this purpose. Second, he arranged for the importation of several varieties of hybrid corn from the Agricultural Research Station of the University of Wisconsin for testing purposes. ^{7/} And, third, he brought to the attention of officials of the newly organized Ministry of Agriculture the need for selecting a new director for the Bergamo Station to replace Professor Zapperoli who had died during the war. As a consequence of his third step, the Ministry designated Professor Luigi Fenaroli in 1946 to take charge of its main corn experiment station at Bergamo.

While the roles of Hartman and most of his American associates in Military Government were to be passing ones in the Italian hybrid corn episode, there was one who was destined to play a continuing role over the years in the corn program. He was a former Kansas county agent, Ralph Germann.

^{5/} Interview with Ralph Germann, MSA/Rome, October 1952.

^{6/} Some of the members of Hartman's staff included Stanley Andrews, L. Allbaugh, James Merritt, F. V. Burcalow and Ralph Germann.

^{7/} Ralph Germann handled the details of this operation.

Germann came to be the American corn technician in Italy working closely with the Italian government. While at first he was a member of Allied Military Government, later he became an employee of the United Nations Rural Rehabilitation Administration (UNRRA), then Food and Agriculture Organization of the United Nations (FAO), the Economic Cooperation Administration (ECA), and finally the Mutual Security Administration (MSA).

The New Testing and Experimental Program Begins

The coming of UNRRA in January of 1946, brought new help and emphasis to the hybrid corn movement. UNRRA gave help in four ways during 1946 and early 1947: (1) It imported 500 tons of US-13 for planting for forage purposes; (2) it sent Professor Fenaroli to the United States to study the techniques and methods of hybrid corn production; (3) it provided 35 million lire (approximately \$60,000) for the corn experiment station at Bergamo; and (4) it procured 58 varieties of American hybrids both of open and closed pedigree varieties for testing at the Bergamo Station. The testing began in 1947.

Professor Fenaroli's trip to the United States in 1946 was a fruitful experience. During his eight month's visit he met many of the foremost hybrid corn research workers in America, in the genetic as well as in the agronomic field of corn breeding. ^{8/} In addition, he had an opportunity to observe closely the corn research work being done at numerous agricultural experiment stations. Observers report that this experience has been of great value to Professor Fenaroli in his work at the Bergamo Corn Experimental Station in Italy. ^{9/}

The 58 varieties of hybrid corn ordered by UNRRA arrived in the spring of 1947, and Professor Fenaroli laid out his plots for testing them (and others that he had personally brought from the United States) along side the best local open pollinated varieties. He established four test plots in Northern Italy in the Po Valley. One plot was located at Bemfio in the Province of Milan on an irrigated farm; another at Savigliant in the Province of Cuneo on irrigated land; the third at Aquilea in the Province of Udine on non-irrigated land; and the fourth at Curdomo on non-irrigated land. The results of these

8/ Some of the specialists were: M. T. Jenkins of Beltsville, Md.; R. A. Emerson of Ithaca, N. Y.; N. P. Neal of Madison, Wisconsin; H. K. Hayes of St. Paul, Minn.; R. W. Lindstrom of Ames, Iowa; I. J. Stadler of Columbia, Mo.; and E. Anderson of St. Louis, Mo.

9/ Professor Fenaroli had been a Professor of Forestry at the University of Milan. He states that he entered upon his new duties as head of the Bergamo corn research station with little knowledge in the corn research field but with an open mind and no bias on corn research matters. In looking back, he feels that this lack of bias aided him tremendously on his study trip to the United States and in the conduct of his work in Italy since that time.

tests were decidedly in the favor of the American hybrids. In fact, 80 percent of the hybrids had yields superior to those of the local varieties.

About this time another event occurred that had a strong influence on forwarding the hybrid corn program in Italy and in all of Europe. It was the holding of a European maize breeders meeting at Bergamo, Italy in late July and early August by FAO. 10/ Specialists from eleven countries participated. The session was designed to make available background knowledge about hybrid maize and the modern techniques employed in its development. Dr. M. T. Jenkins, principal agronomist in charge of corn investigations for the U. S. Department of Agriculture, spoke on the history of hybrid maize, methods of breeding and testing, commercial seed production, treatment and grading of seed, and the introduction of hybrid maize into new environments. Dr. P. S. Hudson, Commonwealth Bureau of Plant Breeding and Genetics, lectured on recent developments in genetics and plant breeding. Dr. M. Y. Nuttonson, of the American Institute of Crop Ecology, gave an account of recent work on agro-climatic analogues in relation to plant adaptation and the exchange of plant material among different countries. 11/

The meeting was held at tasseling time in order to utilize the growing material in Fenaroli's fields for demonstrating maize breeding methods. It is reported that the research people who attended this conference were greatly interested and unanimously agreed to undertake the testing of hybrid maize at their own laboratories. 12/ As a result of the interest expressed at this meeting, FAO supplied 30 hybrids of known pedigree to experiment stations in 19 countries in Europe and the Middle East for testing in 1948.

Fenaroli had taken full advantage of the opportunities offered to push the hybrid corn idea in Italy. At his invitation many Italian Inspectors of Agriculture and heads of experiment stations attended the various sessions of the meeting. 13/

10/ UNRRA went out of existence on June 30, 1947, and FAO took over its advisory duties in the field of agricultural rehabilitation. Germann, who had been an employee of UNRRA, became a member of FAO at this time.

11/ "Results of Cooperative Hybrid Maize Tests in Europe - 1949" Food and Agriculture Organization of the United Nations. October 1950, Washington, D. C. P-1.

12/ FAO has held similar maize meetings in 1949, 1950, 1951, 1952, 1953 and 1954. It has continued its program of distributing various varieties for testing.

13/ The Ministry of Agriculture has a main field office in each province (state). The head of this field office carries the title "Provincial Inspector of Agriculture". He has both advisory (Extension) and regulatory duties.

Expansion in 1948

As the 1947 season drew to a close, Fenaroli and Germann decided to obtain the views of Dr. Jenkins, of the United States Department of Agriculture, who was well acquainted with European conditions on a 1948 program. Substantial progress had been made in the 1947 testing work, and it was time to look ahead. As a result of this decision, Germann met Jenkins in Washington to discuss the tentative plans that he and Fenaroli had agreed on. After serious consideration the following steps were recommended: 14/

1. Continue the testing and experimental work under the supervision of the Italian Ministry of Agriculture and the Bergamo Corn Experiment Station. 15/

2. Begin commercial hybrid seed corn production on a small scale under the direction of the Bergamo Station. Import the F-1 crosses from the United States for this purpose. FAO would provide free seed.

3. Import a small amount of hybrid seed that had produced good results in the Italian tests, and launch a demonstrational program on Italian farms. 16/

Fenaroli liked these suggestions and proceeded to implement them. FAO supplied 30 varieties of open pedigree hybrids for the testing and experimental work, and Dr. Fenaroli arranged for about 20 of a closed pedigree type. The testing and experimental work proceeded as planned.

The production part of the program also made progress. Fenaroli secured F-1 crosses of US-13 from the United States (through FAO) and produced a small amount of hybrid corn of good quality on a commercial scale from one-half hectare of land.

The demonstrational part of the program was equally successful. Fifty tons of four different varieties were imported and distributed by the Federazione Italiana Dei Consorzi Agrari (Federconsorzi), a semi-governmental agricultural buying and selling cooperative, under the supervision of the Agricultural Inspection Service to 3,000 farmers. This seed was planted in

14/ In fact Germann was dispatched to Washington to report to FAO headquarters on the results in all participating European countries. The sessions with Dr. Phillips, head of FAO's Agriculture Division, and Dr. Jenkins, were for the purpose of considering the overall European program as well as the Italian one.

15/ Five other research stations in Italy have cooperated with Professor Fenaroli in his research work.

16/ Letter from Lena Passerini, Agricultural Division of FAO, Rome to R. W. Phillips, Acting Director, Agriculture Division of FAO, Washington, November 25, 1948.

1,500 hectares in 39 provinces of Italy. Instructions on the use of the seed had been prepared by Fenaroli and these were passed out to each farmer as he picked up his bag of seed. In some of the heavier corn producing provinces the demand far exceeded the limited supply. In Brescia, for instance, about 4,500 commercial farmers wanted a sample of hybrid corn to plant, but there was only enough for 600. 17/

ECA Enters the Picture

On July 1, 1948, the short-term Interim Aid Program (April to July) came to a close, and the new Economic Cooperation Administration took over the task of aiding Italy's economic recovery through the Marshall Plan. As was to be expected, the first few months of the new organization's tenure were devoted largely to analyzing the economic problems of the country in cooperation with the Italian government, and then determining programs that it was believed would help effect Italy's recovery. In the field of agriculture this program development process took place under the leadership of Mr. Harry Mc Clelland, Chief of the Food and Agriculture Division of the Special ECA Mission to Italy. Although Mr. Mc Clelland was a graduate of the Harvard Law School, he was a man of wide agricultural experience. He had been Director of Operations of California Land, Inc., - one of the largest agricultural organizations in the United States. In this capacity his work had involved the management of 3,000 ranges totaling 1,500,000 acres of diversified crops in the West. Later he had become Vice-President of the Bank of America in San Francisco in charge of agricultural activities, largely agricultural credit. It was from this position that he had accepted his new assignment with ECA in Italy. Mc Clelland's knowledge of agricultural improvement came to stand him in good stead in Italy. 18/

Thus during the summer and fall of 1948 Mc Clelland and his staff found themselves busy working with the Minister of Agriculture and his bureau chiefs in developing an agricultural economic and technical assistance program. Seventy billion lire of counterpart funds had been allocated for the use of the agricultural segment of the ECA program, and the task was to determine and

17/ Interview with Dr. Ugo Volante, Agricultural Province Inspector of Brescia, November, 1952. Brescia is one of the leading corn producing provinces of the Po Valley. Eighty percent of its 40,000 farmers grow corn. Volante attributed this initial heavy demand to the confidence of the farmers in the Agricultural Inspection Service and in Fenaroli. Fenaroli had been the head of the Brescia Inspection Service at one time.

18/ Members of Mc Clelland's staff included: Edward Corfitzan, John Howard, Gerald Huffman and Grover Kinzy. Howard, Huffman and Kinzy arrived during the fall of 1949.

develop projects that would use the money effectively. 19/ There is not space here to go into the details of this cooperative program development process. However, in general, it followed a pattern of: (1) A joint study of, say, the status of agricultural research; (2) the discussion of problem areas resulting from these studies; and (3) the development of specific projects. During the third step the Ministry put on paper its proposal for a course of action. The proposal was then discussed in joint session until agreement was reached.

Mc Clelland Sizes up the Hybrid Corn Situation

During this program development period Mc Clelland became well acquainted with the hybrid corn situation. He talked with Fenaroli and Germann at length, and spent considerable time in visiting the corn experimental fields in Bergamo and the demonstrations on farms. He found the reports on hybrid corn trials highly favorable. The experimental fields at Bergamo and the farmer demonstrations were impressive. The climate and soils of most of Italy appeared to be suitable for hybrid corn development. In brief, the more that Mc Clelland learned about the hybrid corn work and Italian conditions, the more enthusiastic he became about the possibilities of hybrid corn for Italy.

Mc Clelland knew that hybrid corn had revolutionized farming and cattle raising in the Midwest of the United States. He was well acquainted with the fact that it had increased corn production by about 25 percent, cheapened the cost of animal feeding and boosted the cattle industry. It seemed to him that it could do even more for Italy where corn was badly needed not only for pigs, cattle and poultry but for human beings as well. In his opinion, hybrid corn could: (1) Eliminate Italy's annual import of 500,000 tons of feed grains; (2) improve the Italian pig, cattle and poultry supply situation and thereby help the nutrition problem; (3) eliminate Italy's annual import of 100,000 tons of wheat; (4) produce hybrid seed for export; and (5) make the business of farming more profitable. Thus, for economic and nutritional reasons, it seemed that everything was to be gained from an increased effort on the hybrid corn front. In his opinion the previous corn work had laid the groundwork. This had involved a conservative research and demonstrational approach. Now it was time to give the program the big push. The hybrid corn idea also appealed to him from a strategic viewpoint of getting the overall agricultural program underway. A strong hybrid corn project should be a striking way of bringing aid to Italy and making a major contribution to its agriculture.

Plans for 1949

Having made a decision on the importance of pushing the hybrid corn effort, Mc Clelland immediately discussed a detailed plan of campaign with his Italian associates. 20/

19/ See appendix for explanation of counterpart funds. 1,000 lire is equivalent to \$1.60.

20/ The following individuals in the Ministry came to play leading administrative roles in the Italian hybrid seed corn movement: Prof. Albertario, Head of the Bureau of Agricultural Economics; Prof. Aurelio Carrante, Director General for Agricultural Production; Prof. Ferdinando De Luca, General Inspector, Director General for Agricultural Production; and Dr. Domenico Nenna, Chief Inspector, Direction General for Agricultural Production.

Several meetings were held in the early fall of 1948 to discuss what should be done. In general Mc Clelland found common agreement on expanding the program in 1949, but some division within the Ministry as to the rate of expansion. A conservative element felt that it was well to expand the program, but that it should be done along lines of traditional research and demonstrational methods. Members of this group pointed to the meagerness of the experimental work thus far, and the dangers of expanding on a commercial basis too quickly. 21/ On the other hand, a more liberal element tended to side with Mc Clelland that it was time to push ahead vigorously. All agreed, however, that nothing could be done in the way of ordering varieties from the United States until the records of the Provincial Agricultural Inspectors on the hybrid corn demonstrations were gathered and analyzed.

By early November, 1948, the reports from the field were so highly favorable on the hybrid corn trials that a number of the key ministerial officials came out strongly for Mc Clelland's approach. 22/ The Head of the Bureau of Agricultural Economics expressed himself as follows on plans for 1949:

"On the matter of hybrid corn - which you have so kindly discussed with me - I heard the opinions of Professor Fenaroli of the Corn Cultivation Station of Bergamo, of Provincial Agriculture Inspectors, Directors of Consorsi Agrari and, lastly, of a number of intelligent farmers.

"Everybody agreed that hybrids are of the utmost importance for the improvement of our corn cultivation - and I have been fully convinced of this for quite a long time. As a cultivation, corn has been at a standstill for 50 years. The use of hybrids now appears to be one of the most, if not the most, fruitful instruments of technical-economic progress. The results of the experiments conducted this year confirm the brilliant success of last year - in fact, they make it almost probatory.

"Farmers are becoming infected with the 'fever of experimentation'.

"Professor Fenaroli believes that it will certainly be possible to sell 10,000 quintals of seed, and contemplates to distribute it as shown in the attached list. I do not feel that he is unduly optimistic - of course, price will be one deciding factor. If it should be around 25,000 lire per quintal, that quantity would not be exceeded; perhaps, it would hardly be reached. However, should the price be kept down, perhaps even halved, then the 10,000 quintal might become even 12,000 or 15,000 - which would mean bringing the area cultivated with imported seed up to around 40,000 hectares.

"I feel that we should aim at that goal, through the propaganda which is now easily taking hold among agriculturists, and creating incentives to try out hybrids, also by removing the uncertainty which would necessarily prevail with a price of 4 or 5 times ours.

21/ Competent observers report that this attitude was based on (1) the fear of communist attack if the project should fail, and (2) the belief that it was not scientific to expand too quickly.

22/ Using an index of 100 for production of the best local varieites the hybrids gave returns varying from 32.1 to 187.29 bu. per acre with a considerable number over 100.

"Have you seen yet the results of the Mantua experiments? They are truly wonderful; the yield has gone up to 50-70 quintals per hectare, as against 42 of the indigenous variety. If you will facilitate our work, that will be one more of your many accomplishments of generous assistance in everything which may signify true progress of our agriculture, and with it the social farming world." 23/

Faced with the urgency of taking action on parts of the program if it were to be expanded in 1949, the Mission and the Ministry arrived at these decisions by the middle of November: (1) Import approximately 1,200 tons of hybrid corn seed for commercial production purposes for 1949; (2) continue the testing of American hybrids; and (3) encourage the development of Italian hybrids. Other important questions had also been discussed and agreed upon. One dealt with subsidies for farmers. The Italian officials were of the opinion that it would be necessary for the government to heavily subsidize the sale of hybrid seed to farmers for the first year or two to bring the cost of the hybrid seed in line with the cost of local varieties. Otherwise, the farmers who were used to using their own seed year after year in many instances would not try out the hybrid seed. Furthermore, the subsidy would serve as a "risk payment" assumed by the government on behalf of an innovation which a large number of farmers were being asked to accept, partly to demonstrate to other farmers the value of the new seed, and partly to gain research data on hybrid performance over a wide range of farming conditions. These arguments seemed logical to members of the Mission, particularly in view of the fact that agricultural credit facilities for the average farmer were extremely limited. As a consequence of this decision, 230 million lire of counterpart funds were set aside for subsidy purposes. Seventy million lire for supervision of the program and for breeding work were also agreed upon.

The mechanics of the operation received careful consideration. How was the seed to be distributed? This question was soon answered. The seed would be received and distributed by the Federconsorzi. In fact, there appeared to be no other solution. It was the only organization in Italy which had the facilities and resources to reach the individual farmer. The Federconsorzi has been described as a semi-governmental agricultural buying and selling cooperative built upon small organizations of farmers at the local level; it possessed a monopoly in most agricultural buying and selling operations.

Purchase of the Seed

Shortly after these basic decisions had been made, Minister of Agriculture Antonio Segni and the Head of the Bureau of Agricultural Economics, Professor P. Albertario, traveled to Washington to attend the annual FAO meeting.

23/ Letter from Professor P. Albertario, Head of Bureau of Agricultural Economics, Ministry of Agriculture to Mr. Harry Mc Clelland, November 3, 1948.

While in Washington, they met Mr. John Nicolson, President of the United Hybrid Growers Association of Shenandoah, Iowa. Mr. Nicolson took this opportunity to point out the fine results of his hybrids in the Italian tests and demonstrations and urged the minister to purchase Italy's 1949 needs for hybrid seed from the United Hybrid Growers Association. His proposition included a plan for (1) a joint United and Federconsorzi experimental program in Italy, and (2) a training program for Italian research workers at the "United Hybrids" facilities in the United States.

After viewing United's large experimental center, the Italian representatives decided to purchase 400 tons of each of three varieties of hybrids making a total of 1,200 tons for 1949 from the United Hybrid Growers Association. It seemed to them that this was a sound decision because United's seed had performed well in Italy, the work at United's research center was impressive, and placing an order early would save money. Then too, the use of United's facilities for training Italian hybrid research workers would help place the Italian program on a firm footing.

During the course of the FAO Washington conference, the United Hybrid Company had given a luncheon for the representatives of the various countries. It was reported later that some country representatives gained the impression that the United Hybrid Growers Association represented all of the hybrid corn producers in the United States.

As the news of this luncheon and the sale of "United" seed reached the ears of United's competitors, protests began to flow into ECA's Washington headquarters. The Washington office wrote to Mc Clelland in Rome asking for more information on the 1948 results, acquainting him with developments in the United States, and cautioning him on procedure. The news of the Italian purchase of 1,200 tons of hybrid corn seed came as a surprise to Mr. Mc Clelland. It was apparent that a misunderstanding existed concerning procedure for purchase of the seed. Mr. Mc Clelland had planned to place the entire order through regular ECA channels as soon as more complete results from the 1948 tests had been secured.

In the meantime, Dr. Jenkins had arrived in Rome in early December, 1948, to make arrangements for an FAO hybrid maize meeting in January of 1949. Mc Clelland took advantage of his presence to call a meeting with Italian officials to review the situation and to determine what, if anything, needed to be done on the purchase situation. Jenkins pointed out that the success of the hybrid seed corn program in Italy depended upon broadening the base, not restricting it. In his opinion, they simply could not build a program upon 3 or 4 hybrids. He urged them to purchase seed from several sources. 24/ Jenkins pointed out that the competition of seed companies in the United States

24/ The United Hybrid Company had pressed for a five year exclusive contract which the Federconsorzi, acting for the Government, had turned down.

had been one of the main reasons for the success of the program in that country. He felt that every encouragement should be given by ECA and the Italian government to foster a similar development in Italy.

Members of the Mission and of the Ministry were impressed with Dr. Jenkins' counsel. They decided to: (1) Add an additional 800 tons to imports for 1949; and (2) encourage the development of hybrid seed corn companies in Italy. It was agreed that the order for the additional 800 tons should be placed with competitors of United. Emphasis was to be given to the importation of open pedigree lines and to flat seed rather than round. The decision to import flat grades at a higher cost was based on the fear of communist propaganda. It was felt that, if the cheap grades of round seed were purchased, the communists would claim it was poor seed that American farmers would not plant, and therefore it was being dumped in Italy.

In line with these decisions, ECA arranged for a total import program of 2,000 tons of hybrid corn seed for the 1949 season. 17 varieties were involved.

The 1949 Season

The year 1949 was to bring many interlocking developments on the hybrid corn front. All of these supported one another and were a part of the total picture. It is possible here to cover only the more important ones that affected the progress of the program.

To recapitulate: The decisions had been made to: (1) Continue the testing of American hybrids; (2) encourage the development of Italian hybrids; and (3) push vigorously the commercial production of hybrid corn. A subsidy was to be offered Italian farmers to help gain their acceptance of the new seed.

The FAO Maize Meeting

The FAO maize meeting in Rome, January 10-13, 1949, took place as scheduled. While it was not a part of the Italian hybrid corn program as such, nevertheless, the holding of this meeting in Rome with many Italian authorities in attendance exerted direct and indirect influences on the conduct of the Italian program. The meeting had two specific purposes: (1) To pool the information obtained from the tests of hybrids and inbred links supplied by FAO in 1948; and (2) to set up a permanent organization of maize specialists throughout Europe to continue the work that had been started by FAO.

Dr. Jenkins proposed the establishment of a permanent organization of maize specialists. The philosophy and the principles of procedure that he expressed in setting forth this proposal made a deep impression upon those in attendance and warrant repeating here.

"In the developing of adequate adapted hybrids for Europe, Dr. Jenkins thought that the American material could serve as a starting point. For best results European hybrids will have to be bred in Europe.

"Dr. Jenkins stressed the fact that in the United States the real improvement in the development of hybrid maize dated from the organization of the Corn Improvement Conferences which sponsor the free interchange of breeding material. Maize breeding programs are so expensive to conduct and require so much land and labor that no one State possessed the funds needed for this program. Little progress was made in the commercial development of hybrid maize until a cooperative program was organized. The best U. S. hybrids combine lines from several programs. He felt this was a lesson that Europe should take to heart. The best way to develop an adequate maize improvement program in Europe is on a coordinated basis with a free interchange of the results of the tests in the different localities and with a combination of producing material, interchanging material and trading stock so that the whole continent can be serviced. From the long term standpoint, Dr. Jenkins believed that the organization of a European Cooperative Maize Program with definite assignment of objectives and definite assignment of duties and the facilitation of every means for the interchange of breeding material and results of tests was the most important thing that could be accomplished by this meeting." 25/

As a consequence of this proposal plans were made for a permanent organization. For various reasons, however, it was not found possible to establish this organization as a financially independent body at that time and FAO has continued to be responsible, through its annual meetings, for the functions which the proposed organization was intended to assume. These have included the diffusion of technical information, the exchange of breeding material, the coordination of cooperative tests of North American hybrids and summaries of the resultant data, and encouragement of the cooperative testing of locally developed inbred lines with a view to the eventual development of European hybrids (see mimeographed reports of the annual FAO Hybrid Maize Meetings from 1947 to 1954, and printed summaries of the FAO Cooperative Hybrid Maize Tests in European and Mediterranean Countries - 1947/8, 1949, 1950, 1951 and 1952). The cooperation encouraged through these meetings has done much to advance the hybrid corn movement throughout Europe.

25/ Meeting on Hybrid Maize. Food and Agriculture Organization of the United Nations. Rome, 10-13 January, 1949. P. 3-4.

Launching the Campaign

As the 1949 campaign commenced, there existed a singleness in purpose among the parties concerned. It seemed to boil down to this: "Hybrid corn is good for Italy. Let's get behind this program and put it over". A spirit of cooperation existed between the Ministry and the Mission. It was understood that each would play its part in implementing the program. 26/

Professor Ferdinando De Luca of the Ministry, Professor Vittorio Marchi of the Federconsorzi, and Professor Luigi Fenaroli of the Bergamo research station worked closely with one another in making arrangements for getting the 2,000 tons of seed into the hands of farmers. It was to be the task of the Federconsorzi to receive and transport the corn to its local cooperatives scattered throughout Italy. It was to be the job of the Ministry and Fenaroli to enlist the services of the Province Agricultural Inspectors and to be in general charge of propaganda activities. The Inspectors, in turn, were to control the issuance of the seed and to give technical advice to farmers on its use. They also were to keep records on some of the plantings under Professor Fenaroli's supervision.

In accordance with the promotional plan, newspaper publicity on the hybrid corn project began to appear throughout Italy during January of 1949 and it was continued over a period of several months. Some releases were prepared by the Ministry, and some by the Mission. This publicity, in turn, was supplemented by talks of Mc Clelland, Fenaroli and their associates at agricultural meetings. Mc Clelland soon earned the name "Hybrid Harry" for his enthusiastic sponsorship of hybrid corn.

Professor Fenaroli with the cooperation of Germann, prepared a sheet of instructions for regional agricultural inspectors pointing out the special characteristics and requirements of hybrid seed and requested their cooperation in giving technical assistance to farmers. He also prepared and issued, in cooperation with the Mission, a bulletin on hybrid corn. It covered "what is hybrid corn", "what it has done for the U. S.," - and "what it can do for Italy".

The educational program also included the production of a film on hybrid corn. It depicted the use of corn by the American Indians, the development of hybrid seed corn, and the plan to introduce it into Italy. This film was widely shown.

26/ One illustration of this desire for cooperation and close coordination deals with Germann. In January of 1949 his office was moved into the ministry proper so that he might be able to render close technical support. By this time he spoke Italian fluently and could operate without an interpreter.

Twelve hundred tons of the seed arrived in Genoa, Italy, on March 1 and the balance of the order a few days later. Distribution to local cooperatives began immediately.

While this was going on, several other developments were taking place simultaneously. Up to this point the Chamber of Deputies and the Senate had not given their approval to the use of the 300 million lire for the hybrid seed corn project. 27/ This was granted on April 19, 1949. It provided for 230 million lire for subsidies to farmers and 70 million lire for research work and supervision of the commercial phase of the program.

The Interministerial Price Committee of the government then went into session and set a price of 21,500 lire per quintal on the imported seed. The subsidy was set at 11,500 lire leaving a farmer price of 10,000 lire per quintal. After these final decisions had been made by the government, the distribution of the seed to farmers took place rapidly. The promotional campaign had been effective. Approximately ten thousand farmers throughout Italy purchased the 2,000 tons of seed. Each farmer received about two bushels of seed. 45,000 hectares, or 5 percent of the total maize acreage in Italy was planted to hybrid corn in 86 of the country's provinces. The largest proportion of the seed was planted in the Po Valley of North Italy. 28/

The Experimental and Demonstrational Phases of the Program

The expansion of the government's experimental work took place in an orderly fashion. Seed was received from FAO, the United States Department of Agriculture, ECA, and commercial sources. It was planted in 59 fields throughout Italy under the general supervision of Professor Fenaroli. Some of this work included simple and detailed tests in the nature of demonstrational plantings for educational purposes.

In addition to the comparative testing of maize hybrids, the research work involved efforts to improve United States hybrids from their parental inbreds, and to breed new and better adapted hybrids from local and foreign inbreds. This phase of the work was aimed at developing a national program of hybrid maize production. 29/

27/ ECA had given its approval as had the Ministry of Agriculture. But final approval on the Italian side rested with Parliament.

28/ The 300 million lire for hybrid corn was part of Public Law 165 under which the entire 1948-1949 ECA program was approved. Interview with Ralph Germann MSA/Rome, November 1952.

29/ "Results of Cooperative Hybrid Maize Tests in Europe, 1949." Op., P-28.

Entrance of American Seed Companies

Three American hybrid corn seed companies came to play leading roles in the promotion and development of the Italian hybrid seed corn program. They were the United Hybrid Company, Asgrow and Funk. ^{30/} Funk in cooperation with the Corn Products Company which had a prewar organization in Italy, was the first to make a beginning in Italy. It began in a small way in 1948 with a production of approximately 100 tons of hybrid seed. It brought in an American technician to direct seed production and to carry on experimental work.

The United Hybrid Company began to survey the Italian situation in 1948. Mr. Nicolson, the president of the company, toured Italy in person to look over the progress of his hybrids and to make contacts. ^{31/} We have already learned about his success in selling 1,200 tons of seed to Italy for 1949.

The third company, Asgrow, was to enter the competitive field in the spring of 1950.

Returning to our sequence of events, Nicolson made three trips to Italy in 1949 to follow up his business contract with the Ministry, and to make arrangements for entering the hybrid seed production field in Italy. Initially he had hoped to work out a cooperative arrangement with the Federconsorzi for the production of seed, but this plan failed to materialize. Finally, Nicolson hired Dr. Guarnieri and began operations in a direct fashion.

While Mr. Nicolson was interested in the development of the Italian hybrid corn program from a personal business viewpoint, he was also strongly motivated in promoting the Italian hybrid corn program from a broad humanitarian standpoint. Like McClelland, he was completely convinced that the introduction and spread of hybrid corn in Italy would be a great boon to the country. Consequently, he took every occasion to expound the virtues of hybrid corn, urging Ministry and Mission personnel to forge ahead on the hybrid corn program. He also renewed his offer to the Ministry to train Italian corn research workers in the United States. This offer was accepted, and two young Italian research workers, Dr. Luigi Naldi and Dr. Ivo Zucchini were selected to receive this technical training.

^{30/} Some of the key officials and technicians included: Asgrow - Mr. Richard Debé, Dr. Adami, Dr. Luigi Naldi, Funk - Dr. Robert Blattner, Mr. Antonio Cipoletti; United Hybrid Growers Association - Dr. Gino Orefici, Dr. Costanzo Guarnieri. Mr. Nicolson, President of the parent company in the United States, represented his company in Italy directly at times.

^{31/} About half of the 50 tons planted in the 1948 demonstrational program had been procured from the United Hybrid Company.

Technical Assistance in the United States

Dr. Luigi Naldi and Dr. Ivo Zucchini spent approximately six months in America studying the production of hybrid corn under the supervision of the United Hybrid Company. ECA had arranged for their transportation. Two excerpts from Dr. Zucchini's report on his experiences in the United States indicate the nature of the training:

1. "My stay in the United States can be divided into three periods of time:

"First Period: Technical work in the breeding plots of Ames and Shenandoah, where I acquired first-hand knowledge of the production systems of commercial seeds.

"Second Period: Journey of instruction through Iowa, South Dakota, Nebraska, Kansas and Missouri.

"Third Period: Collection of experimental data relative to the states of Iowa, Nebraska, Kansas, South Dakota and Missouri; direct knowledge of the work carried out in a plant for the mechanical selection of seeds.

2. "The training was practical:

"In the breeding plots of Ames and Shenandoah, under the guidance of Dr. Stuart N. Smith and Maurice Mc Neiley, I have personally carried out all the operations for the constitution of pure lines, that is, hooding of the tassels and silks of ears, and self pollination. Besides this, I carried out the operation related to the evaluation of individual pure lines and to the collection of data concerning production, disease resistance, and diseases of several parcels of experimental crosses." 32/

Upon their return to Italy, Dr. Zucchini became an employee of the Federconsorzi while Dr. Naldi returned to his old job as an assistant to Professor Fenaroli. At a later date Naldi accepted a position with the Asgrow Company. Both brought their new knowledge and skill to bear in promoting the hybrid seed corn program. 33/

32/ Ivo Zucchini. "Final Report. Activity Developed in the United States of America for Studying the Production of Hybrid Corn in Connection with the ECA Technical Assistance Plan (July 11 - November 28, 1949)", P 3-6.

33/ In later years ECA and its successor, MSA, sent several groups of technicians to the United States for technical training. Their programs of study were developed in cooperation with the U. S. Department of Agriculture.

Opposition Forces

Opposition to the developing program began to appear in the fall of 1948, and it took on fresh vigor during the spring promotional campaign of 1949. It stemmed from two sources: (1) Old line seed corn producing businesses, and (2) the communists.

Professor Fenaroli encountered the first type of opposition in a struggle that developed within the Board of Directors of the Bergamo Experiment Station. The President of the Board ran a seed corn producing business for the local unit of the Federconsorzi. The President, supported by a number of the members of the Board, took strong exception to Fenaroli's hybrid seed corn project. It, they felt, represented a danger to vested interests. The struggle to remove Fenaroli as manager of the station became so bitter that the Ministry, supported by ECA, was forced to intercede. The President of the Board resigned, and a new person who was more favorably disposed to the program took his place.

In general, the opposition of the old line seed companies continued until the fall of 1950 when, after a very poor growing season, hybrid corn came through with a "bang" and the indigenous varieties did not.

The opposition from the communists took the form of newspaper accounts and editorials attacking the program. The intensive promotional campaign in the spring of 1949 featuring American hybrid corn "Granturco Ibridi Americano", made them furious. Anything from the United States was no good. At a later date when 300 tons of free hybrid corn from the United States National Catholic Rural Life Conference were being distributed to small growers by the churches, their newspaper articles followed the line: The seed is no good because (1) it comes from the church; (2) it comes from the United States; and (3) it is free. Therefore, there must be something wrong with it. According to observers, the overall aim appeared to be one of trying to create an impression that hybrid corn symbolized U. S. interference and, therefore, should not be used.

While the opposition of the Communists and old line seed companies was evident, it never took on serious proportions. The resistance of people to changing old ways of doing things was a more serious obstacle. We will speak about this aspect later.

Newspaper Reporting of the Program in the United States

The launching of the hybrid seed corn program by the Ministry and ECA had not gone unnoticed by the reporters of American newspapers. In fact, the project caught their eyes from its very beginning. The story of the success of hybrid corn in the United States was well known. Therefore, it seemed to them that its success in Italy was a foregone conclusion. The

story was a "natural" for the newspaper men, and easily secured headlines in stateside papers.

Excerpts from a feature article in the Washington Post on August 7, 1949, illustrate the treatment accorded the program by some of the newspapers of the United States.

"U. S. Hybrid Corn A New Boon to Italy"

By Frank Gervasi (Post Reporter)

Latina, Italy. Americans who fought here on their way to Rome from Anzio's nearby beaches remember this shell-chewed town as Littoria and a tough one to take from the retreating Germans.

Its name has been changed in the general rush to forget Mussolini and his works. For he built Littoria as a shiny, exaggeratedly modernistic capital of the Pontine Marshes.

But bigger changes than a switch in names are happening here. In the course red soil of the fields along the Appian Way, a revolution is gestating.

IL Duce rescued the 75,000 acres of the Agro Pontino and its people from malaria and the flooding rivers. But he never saved them from poverty. That job was left for a couple of imaginative Americans, with the help of a few sacks of hybrid corn seed and the sweat of Italian farmers.

It may take 10 years, but Ralph Germann, a rugged, 39-year old redhead from Fairview, Kansas and his boss, hustling Harry Mc Clelland of San Francisco, are confident that the job will be done.

Mc Clelland, former vice president of the Bank of America, is head of the agricultural section of the ECA mission in Rome. Germann runs the hybrid corn show.

Both believe that just as much European reconstruction can be done with only "a little money, a few tools and seeds and a lot of know-how and hard work" as with billions of dollars. And in their opinion the hybrid corn program is "by far the most spectacular thing we have done since Marshall aid began." It will particularly benefit Italy.

Unitl Mc Clelland and Germann came along with their leaflets, pep talks and sacks of US-13, U-50, Iowa 306, Funk G-114 and a dozen other varieties, the farmers of the Agro Pontino were considering giving up corn as a regular crop in favor of more profitable tobacco and cotton. Had they done so, Italy would have had to import more maize from America and Canada, using Marshall dollars which might have been better spent for machinery and raw materials.

But hybrid tests run in the Agro Pontinio have proved to its peasants that they can increase their yields by from 25 to 40 percent. Some experiments in Lombardy have indicated that it is possible to raise corn output in those more fertile areas by as much as 127.2 percent.

An overall national increase of at least 30 percent could be achieved in Italy, American experts believe, without multi-million dollar investments or fancy machinery. It would not be necessary to alter substantially the present pattern of Italian agriculture which, although backward by our mechanized standards, is highly rated by our experts.

"We say out in California," as Mc Clelland put it, "that the best fertilizer is the farmer's footsteps - meaning that hard work and care produce the biggest and best crops. Well, Italian farms certainly get that kind of fertilizer."

Mc Clelland explained the arithmetic of the potential corn revolution.

"Italy," he said, "annually puts about 1,500,000 hectares into corn. If by 1952 we can induce Italian farmers to plant a fifth of that area in hybrid corn, Italy could add 750,000 tons to its maize output."

"With corn at \$120 a ton, that would add about 90 million dollars to the value of the Italian crop. Italy, which was obliged to import 100,000 tons of corn last year, would not only become self-sufficient in that grain but would become an exporter."

"Even this year, with only 130,000 acres in hybrid corn, Italy will grow 45,000 tons more corn than it usually does, nearly half what it imported last year. It will save about \$5,500,000 - that much less to be drawn from Marshall funds."

Mc Clelland became eloquent as to what Italy could achieve in 10 years. With 90 percent of the country's corn acreage sown with hybrids, he estimated, Italian production could reach 4,500,000 tons - 1,500,000 tons more than it is now. The country could become, he said, a hybrid corn producing center for all Europe.

With hybrids selling at \$230 a ton, Mc Clelland pointed out, the seed could become one of the country's most valuable exports, perhaps replacing in importance even silk, now meeting head-on competition from the Japanese output.

In the experimental plots at Maccarese, Torre in Pietra and here in Latinia, there was evidence that Mc Clelland's and Germann's hopes for Italian corn production might be realized. The maize stood tall in the fields just off the Appian Way - the stalks thick and juicy, the leaves green and broad clear down to the dry soil. There were two and often three good ears to every plant, bespeaking abundant ensilage for cattle and plenty of meal for polenta.

For "experimenting with hybrid corn seed imported from the USA", the government has set aside \$500,000. Yet through the hybrid program alone, the state may accomplish more in 10 years than with the hundreds of millions of dollars which will be poured into more ambitious projects.

Success or failure of the hybrid corn program will depend largely on whether or not the peasants can be educated to accept the new fangled stuff. Germann believes they can. He influenced many American farmers in favor of hybrid corn when he was a county agent back in Russell County, Kansas.

"Sure there is resistance on the part of some farmers," he said. "Farmers anywhere are less open to new ideas than other people. It took us 20 years to put hybrid over in the States. I think it can be done here in 10 years. It is a matter of life and death in this country, not merely one of profit and loss."

A lot has been accomplished already, and with a relatively small investment, monetarily speaking. Germann estimated that the seed for the first tests in 1944 and three subsequent years cost less than \$300.

In 1948, 50 tons of hybrid corn were brought in. This year, Italy imported 2,000 tons for about \$400,000. The anticipated additional yield of 45,000 tons will bring farmers \$5,500,000, more or less. Not a bad return on the investment. 34/

Trouble Spots in the Program

As the 1949 season progressed, conflicting accounts began to roll in from the field. Many were favorable to hybrid corn while others were not. Fenaroli and Germann found themselves busy dashing from one farm to another to determine the cause of unfavorable reports. The season had not been

34/ Frank Gervasi. "U. S. Hybrid Corn A New Boon to Italy." Washington Post, August 7, 1949.

favorable for maize because of late frost, a summer drought, and an outbreak of the dwarfing disease. Serious losses in yield, particularly in sub-alpine regions had taken place. The hybrids seemed to be particularly hard hit by the dwarfing disease.

Fenaroli and Germann found many reasons why hybrid seed had not lived up to expectations:

1. The seed had arrived late, and as a result had been planted too late in some regions.

2. Distribution of the various varieties had been faulty. Due to a lack of knowledge some late varieties had been distributed and planted in early areas and vice versa.

3. Despite warnings, a number of farmers had replanted seed from their 1948 hybrid corn crop.

4. Farmers tended to plant too much seed.

5. There existed a general lack of adequate hybrid corn information on the part of distributors, agricultural inspectors and farmers.

6. The information that had been given to growers on maturity dates of the various varieties had been based on experiences in America. Performance under Italian conditions did not always coincide. Also information on maturity dates proved to be erroneous because dates of maturity were calculated in different fashions in the U. S. and in Italy.

7. Some of the seed did not meet specifications. Germination, grades and appearances were frequently not satisfactory.

8. Sacks were poorly labeled. It was difficult to determine names of the varieties.

9. Farmers complained that they lost a lot of time because of red tape. They had to go to the office of the Agricultural Inspector to secure a paper pertaining to their subsidy, and then they had to go to the local branch of the Federconsorzi to get their seed.

10. The ravages of the dwarfing disease had been severe in some areas.

11. The American hybrids did not appear to be adapted to the drier areas of Central and South Italy.

As these reports became publicly known, criticism began to appear in the Italian press.

"Arnia Communicates:

"The Ministry of Agriculture has requested the Experiment Station for Maize Culture of Bergamo to call, as soon as possible, a meeting of all Directors of Vegetal Breeding Institutes and Agricultural Experiment Stations in order to coordinate the elaboration of data relating to hybrid corn of American origin.

"In our opinion, the initiative taken by the Ministry of Agriculture was necessary because farmers who have grown hybrid corn have met with serious disappointments. In numerous cases, production has not lived up to the expectations justified by the growing strength of the plants. Returns have often been lower than with local breeds. Such a remark applies in particular to Central Italy, but - to the best of our knowledge-it does not appear that in other regions unit production have been consistent with the promises of propaganda in favor of hybrid corn." 35/

Visit of the O. E. E. C. Team

While these setbacks were disturbing to Fenaroli, Mc Clelland and their associates, they were soon to receive words of encouragement from a group of maize specialists. The Organization for European Economic Cooperation (O.E.E.C.) had arranged with ECA to have a team of eminent corn specialists visit Italy as well as a number of other European countries to survey the hybrid corn situation and render assistance. In accordance with this plan, Dr. Jenkins, Mr. Watkins and Dr. Ferguson visited Italy during the period September 12-17, 1949. 36/

The members of the team were pleased with the progress of the program but cautioned the Ministry and the Mission on future expansion. They commented:

"The hybrid maize program in Italy has been successful to-date. However, a word of caution regarding future expansion may well be in order. Hybrid maize is still in the experimental stage in Italy and further expansion should be gradual. There still remains the problem of determining the best

35/ Excerpt from *Giornale di Agricoltura*, August 28, 1949.

36/ Dr. Merle T. Jenkins, Principal Agronomist in charge of corn Investigations, U. S. Department of Agriculture has been mentioned several times before in this paper. He came to be regarded as the father of the Italian hybrid corn program by many of the Italian technicians. Mr. W. F. Watkins was Chief of the Seeds, Fertilizer and Pesticide Branch of Food and Agriculture Division, ECA, Washington. Dr. Carl E. Ferguson was an agronomist in O. S. R., Paris.

hybrids for many areas, as well as those most resistant to local diseases, particularly the "yellow dwarf" disease that has caused some concern during the past season.

"The local production of hybrid maize seed should be expanded as rapidly as possible. From the standpoint of soil, climate and low cost labor, Italy is especially well situated to become an excellent hybrid maize seed producing region. This possibility should be explored to the fullest extent." 37/

Results of the 1949 Season

As the 1949 hybrid corn harvest came to a close, the ECA Mission reported on the progress of the project:

"Italy has just completed its harvest of 150,000 acres of hybrid corn produced from 2,000 tons of seed imported from the United States under the ECA Program. Although the results have not yet been tabulated, there is no doubt that with the exception of some areas where pest and drought have cut down yields, that the production was most encouraging. As a result thereof it can be clearly stated that although the Hybrid Corn Program is still in an experimental stage, the production of hybrid corn in Italy is now an established fact.

"In addition to the production program, substantial strides have been made in the experimental field and in the development of Italian produced hybrid corn seed. At least three large commercial producers from America have already established or are planning to establish themselves in business to produce hybrid corn seed in Italy. In addition thereto the hybrid corn Station at Bergamo, under the direction of Professor Luigi Fenaroli, is making excellent progress in the development of the inbred lines from which can be produced real hybrid corn seed. The progress is remarkable when it is remembered that this is only the second year in which hybrid corn has been produced commercially in Italy." 38/

Plans for 1950

With the 1949 crop out of the way the Mission began to think about plans for the 1950 season. Mc Clelland wrote to the Under Secretary of Agriculture on November 4, 1949, calling his attention to the desirability of developing, at the earliest possible moment, a program covering hybrid corn for 1949-50. His letter covered several points:

1. The urgency of the need to collect, consolidate, and analyze the reports of the Agricultural Inspectors on the yields by varieties and location in order that steps might be taken to arrange for the 1950 imports.

37/ Food and Agriculture Committee. Report on Hybrid Maize in O.E.E.C. countries. O. E. E. C., Paris, December 9, 1949, P. 31-32.

38/ From Hybrid Corn Release. ECA Special Mission, Rome. November 9, 1949.

2. The Mission's general satisfaction with the progress of the program, and its belief that a minimum of 4,000 tons of seed should be imported for 1950 use.

3. The Mission's support of a subsidy for 1950, the amount to be determined after a review of the situation. The Mission was also in accord with the idea that subsidies should be gradually reduced each year.

4. The willingness of the Mission to support an expanded experimental program.

5. The need for consideration of specifications of seeds to be imported, arrangements for distribution through the Federconsorzi, size of the bags, etc.

Mc Clelland stated in his letter that he had been following the program very closely: "and I assure you that it has created a tremendous lot of very favorable comments in the United States and has contributed greatly to the general opinion that Italy is making real progress under the Marshall Plan."

He concluded by assuring the Under Secretary of the full support of the Mission on the project and urging prompt action on getting a 1950 program underway. 39/

The gathering of information on the varieties and its analysis took time. As the days went by one by one, the Mission became worried about the prospects of getting the 1950 program off to an early start. ECA/Washington had proposed a schedule that called for "November - agreement on import program and planning of commercial purchase contracts; December - opening letters of credit and giving U. S. companies time to obtain bags and prepare seed for shipment; January - bagging and delivery to U. S. ports; February - ocean transportation; and March - distribution in recipient country." 40/ The time was getting short to establish a program and to reach an agreement on its financing.

Late in November the Ministry informed the ECA Mission that it had made a tentative decision to import 2,000 tons of 17 varieties for commercial planting, but that it would need more time to work out the specific information needed for the actual order. The tentative decision had been based

39/ Letter Harry Mc Clelland, Chief, Food and Agriculture Division, Special ECA Mission, Rome to the Honorable Emilio Colombo, Under Secretary of Agriculture, Ministry of Agriculture and Forests, Rome, November 4, 1949.

40/ Cable ECA/Washington to ECA/Rome, November 11, 1949.

upon the review of performance and adaptability by 30 Italian technicians.

Mc Clelland advised ECA/Washington of the tentative decision and waited for final action of the Ministry. Finally, in desperation, he wrote to the Minister of Agriculture on December 27, 1949, expressing his disappointment on the lack of progress in determining a 1950 program. He pointed out that the ECA Mission had not been consulted on specifications which would govern the purchase of the seed, the methods to be used in purchasing the seed, and the amount of the seed to be imported. "We are still in the dark why Italy is limiting her purchase to 2,000 tons, the same as last year. On what basis was this decided, and why was there not an increase? If there were grower resistance, what steps are being taken to give the farmer an explanation or a remedy for any difficulties encountered?" He concluded by urging that (1) an immediate order be placed for hybrid seed; and (2) a competent committee be established to review the whole hybrid corn project and to take charge of the program for 1950. 41/

Mc Clelland's appeal to the Minister brought results. In a short time the Ministry and the Mission reached agreement on a 1950 hybrid corn program similar in nature to the 1949 one, and Dr. Vittorio Marchi of the Federconsorzi and Mr. Ralph Germann of the ECA were dispatched to the United States to buy 2,200 tons of seed. The Italian officials had insisted that 2,200 tons was an adequate supply in view of some poor results in 1949.

The two men arrived in the United States on January 12, 1950, and spent the following three weeks in business consultations with ECA officials, members of the Department of Agriculture and seed company representatives. By the conclusion of this time the technical details of the purchase had been arranged, and they returned to Italy. 42/

The 1950 Season

The launching of the 1950 campaign followed the pattern developed in 1949. Newspaper publicity was followed by detailed instructions from the Ministry to Agricultural Inspectors regarding the use of the seed. The 2,200 tons arrived in Genoa on March 12. Distribution to farmers took place at a price of 9,000 lire per quintal. 43/

41/ Letter Harry Mc Clelland, Chief, Food and Agriculture Division, ECA Special Mission, Italy to Minister Antonio Segni, Minister of Agriculture, Dec. 27, 1949.

42/ Marchi and Germann followed instructions of the Italian Ministry of Agriculture which were based on the advice of a Technical Committee in making the purchase. This was to avoid some of the trouble that had occurred in 1949.

43/ The 1949 price to farmers had been 11,500 lire per quintal. The 1950 subsidy of 10,000 lire per quintal was the same as in 1949. The import price in 1950 made the difference. In 1949 it was 21,500 lire, in 1950, 19,000 lire.

Two new developments took place during the spring that have a bearing on our story. The first was the free distribution of 300 tons of hybrid seed to small and medium growers by the churches. The seed was a gift of the United States National Catholic Rural Life Conference. The second development dealt with the entrance of the Asgrow Seed Company of New Haven, Connecticut into the Italian seed producing business and an industrial investment guaranty of ECA. Under the terms of the guarantee the three American seed companies could invest American dollars in their Italian businesses with the assurance of getting their money back over time in the form of dollars plus an earning increment. ^{44/} The guaranty contract was signed by the Export-Import Bank of Washington as agent for ECA.

Setbacks in the Program

The Mission had calculated the amount of hybrid seed available for distribution in 1950 at 2,600 tons. 2,200 tons were from imports, 300 from the National Catholic Rural Life Conference and 100 from local production in 1949. In view of the fact that the Mission had supported the idea of importing 4,000 tons of seed, the smaller amount did not appear to be an excessive supply for the market. In fact, it seemed to some of the members of the ECA Mission that the Ministry was proceeding with extreme conservatism. Therefore, it came as a distinct shock in late June, 1950, to learn that the sale of hybrid corn was slow, and that there was a question whether the seed supply would be disposed. As the planting season progressed, the extent of the setback in the program became more apparent, scarcely half of the imported seed had been sold. Cottam, Huffman and their associates were dismayed at the news. ^{45/} It was not only the implications of this development for the future of the hybrid corn project but for the overall ECA effort in Italy as well. In many ways the prestige and the reputation of ECA had become closely linked to the hybrid corn program. The heavy publicity that had been given the hybrid corn program in the United States, as well as in Italy, had placed the Mission in a delicate position. If the corn project should fail, the entire agricultural program might suffer severely. The agricultural members of the ECA Mission agreed unanimously that the hybrid corn project must succeed by one means or another.

The ECA Mission was determined to get at the bottom of the matter, and then to make the hybrid corn effort succeed. As a first step, Mr. Cottam wrote to Minister Segni:

^{44/} The ECA guaranty contract of Asgrow, for instance, provided for conversion into dollars of the company's foreign currency receipts up to \$87,500. This included the \$50,000 investment and an earnings increment of \$37,500.

^{45/} Howard R. Cottam replaced Mr. Mc Clelland who had resigned in the spring of 1950 to return to America. Under Cottam's general guidance Gerald Huffman came to take over most of ECA's responsibilities in relation to administration of the program. Ralph German continued as ECA's corn technician. At a later date Robert Tetro was to succeed Howard Cottam as head of the Food and Agriculture Division.

"The Mission has learned that distribution of the 2,200 tons of hybrid corn seed imported into Italy this year has been unexpectedly slow. The reasons appear to be many but perhaps the most important is the lack of timely well-designed publicity. Consequently, we would appreciate receiving at the earliest possible date a complete report of the situation. The Mission stands ready to work with the Ministry on a future program for intensifying the propaganda in Italy so that the 1951 program can regain the losses this year. Because of the dramatic nature of the hybrid corn program in Italy and of the outstanding success last year, publicity in the United States has been great. We anticipate continuing interest by the American press and wish to have full and accurate facts concerning the program, past and future.

"It is our understanding that only about half of the seed imported this year has been purchased by farmers. Hence, there is likely to be a carryover of at least 1,000 tons for next year. While there need not be any loss in the carryover seed, the setback to the program is obvious. Whereas all of the 2,000 tons for 1949 were distributed, this year will end with large supplies on hand. Moreover, the American and Italian seed firms which are producing hybrid seed in Italy from American stock will likely produce more than 2,000 tons for use during 1951. Therefore, the foreseeable supply for next year is likely to be over 3,000 tons or three times the amount apparently sold this year. Even without additional imports for next year, there is an obvious need for a vigorous campaign for the next year to use the 3,000 odd tons which appear likely.

"The reasons for this unforeseen decrease in consumption in 1950 appears to us to include the following:

1. "Lack of timely propaganda (Extension information), the most important aspect of which is clear understanding of the program, the means of distribution, the cost, the advantages, etc.
2. "One of the unfortunate aspects of the 1950 program, which was not properly understood by farmers, was the free gift of 300 tons by the U. S. National Catholic Rural Life Conference to small farmers. While that program was discussed with the Government and the Mission concerning the selection of varieties and other technical problems, the public was not adequately informed that only small farmers would receive the corn seed without charge. Consequently, many Italian farmers delayed the purchase of Government seed through the Federazione hoping to get free corn. Many farmers were not able to understand why some corn seed was for sale. Repetition of such misunderstanding could be avoided another year by proper advance publicity.

3. "In certain areas the results from 1949 hybrid seed plantings were not up to expectations, particularly because of the drought and because of certain insect infestations which were not foreseen. However, we understand that the over-all national program was highly successful and that hybrid seed production was roughly 25 percent above local open-pollinated varieties.

4. "Objection of the local seed companies has, from the beginning, been a deterrent to the sale of hybrid corn. This is a problem that can easily be overcome by good propaganda.

5. "While tangible evidence is not available, we understand that communist propaganda has endeavored to give the impression that hybrid corn symbolizes U. S. interference and hence, should not be used. This idea is so clearly fallacious that it can be combatted by good propaganda.

"The Mission is fully convinced that the setback in the program this year is purely temporary and that rapid expansion of hybrid corn in Italy is inevitable given proper direction. The history of hybrid corn development elsewhere has been so phenomenal that there is no reason for not expecting rapid adoption in Italy. With corn seed requirements standing roughly about 75,000 - 80,000 tons per year, it seems reasonable to believe that consumption of seed could be easily expanded next year to 4,000 or 5,000 tons given the right publicity, notwithstanding the low consumption this spring." 46/

Cottam closed by stating that the Mission stood ready to discuss the matter at any time and that it awaited detailed information on the project.

Cottam also wrote to the Federconsorzi asking for its appraisal of the situation.

The appraisal of the Federconsorzi tended to coincide with that of the Mission. It attributed the setback to (1) the initial delay in ordering the seed and the resulting late arrival of the seed in the provinces; (2) a faulty distribution plan wherein some varieties allotted to a region did not correspond for character and vegetation period to those desired by farmers; (3) too much red tape in the distribution process; (4) a delayed notification of the seed price and the distribution plan; and (5) the free distribution of the 300 tons of seed. The Federconsorzi felt that the setback was temporary and that requests from farmers for hybrid seed would increase in the future.

The Federconsorzi, in pointing out that the local production of hybrid seed would approximate 2,000 tons for 1950, raised the question of utilization of this seed. Would it be used locally, or would it be exported? It expressed its intention to press for reimbursements from the Ministry, in the event there were financial losses from the 1950 campaign. 47/

46/ Letter Howard R. Cottam, Chief, Food and Agriculture Division, ECA Special Mission, Rome to The Honorable Antonio Segni, Minister of Agriculture and Forests, Rome, July 7, 1950.

47/ Under terms of the arrangement with the Ministry, the Federconsorzi had spent its own money in purchase of the seed, for domestic transportation, storage, etc. The officials of the Federconsorzi held the Ministry responsible, at least morally, for any losses which might accrue to that organization as a result of the unsold seed.

The Ministry's reply to Cottam's letter attributed most of the setback to difficulties encountered in 1949, such as dwarfism, and parasite infestation rather than to lack of adequate propaganda and the like.

The Surplus Hybrid Seed Corn Dilemma

The Ministry and the Federconsorzi replies tended to relieve the worry of the Mission about the ultimate success of the hybrid corn program in Italy; but they did little to suggest a way out of the surplus hybrid seed corn situation. If Italian farmers were willing to accept only 1,500 tons of seed in 1950, how could one expect them to take 3,000 tons in 1951?

The Mission soon learned that there were others who were also deeply concerned about the surplus hybrid seed corn problem. The three seed companies, one by one at first, and then as a group began to bring pressure to bear on the Mission for a way out of the dilemma. They wanted to know what the Mission and the Ministry intended to do about disposing of the carryover seed. Would there be a subsidy for 1951, and, if so, would it apply to seed produced by the three companies in Italy? All parties were worried about the market prospects for 1951.

The more that members of the Mission pondered over the surplus hybrid seed corn problem the more complex and difficult its solution appeared to be. It seemed clear that unless demand was stimulated far beyond the 1950 level someone was bound to suffer losses. The creation of such a demand did not look like an easy task in view of the 1950 experience. It also appeared that, if someone were to lose, it could very easily be the Ministry and the Mission and not the seed companies. It seemed to the Mission that all other factors being equal, the farmers would naturally turn to the local production for their seed. This would be seed from the 1950 crop whereas the ECA carryover seed was from 1949 seed production in the United States. It would be very easy for the seed companies to start a whispering campaign against the older seed.

The Mission found itself faced with a difficult situation. On the one hand, it was extremely anxious to move the 1,150 tons of ECA carryover seed. ^{48/} The sale of the seed would avoid substantial economic losses as well as be a means of restoring the prestige of the Mission. It was evident that this portion of the total seed supply could be moved relatively easily by a subsidy such as had been done in previous years-relatively easily, that is, if the subsidy was confined to strictly the carryover of the imported seed. On the other hand, ECA had an obligation to the three seed companies. It had been influential in inviting them into Italy and, even had gone so far as to enter into an investment guaranty with them. Furthermore, the Mission realized

^{48/} This proved to be the actual carryover. The local production in 1950 turned out to be 1,800 tons, 1,700 by the three seed companies, and 100 by Fenaroli and the Federconsorzi.

that the long run success of the hybrid seed corn program depended upon the development of strong hybrid seed companies. It was clear that the companies could not afford to suffer a severe setback at this stage of their development. It was an embarrassing situation for the Mission as it found itself pulled in two directions.

Subsidy or no Subsidy

It is impossible here to go into the details of the discussions that took place over a period of several months in an effort to find a satisfactory solution to the surplus hybrid seed corn problem and to work out a program for 1951. Huffman, in looking back, says that there must have been 40-50 sessions between representatives of the Mission and the seed companies not to mention the numerous conferences involving the Ministry.

Mr. Debe, acting as spokesman for the three seed companies, took the position that: (1) ECA must take the leadership in finding a solution to the problem; (2) ECA should insist that the Ministry and the Federconsorzi start a big promotional campaign early; and (3) the Ministry should compel the Agricultural Inspectors to cooperate on the hybrid corn program. ^{49/} The position of the seed companies on subsidies changed over time. Initially Debe had said that the seed companies did not want a subsidy and that they were prepared to compete with the Ministry's carryover. Later this position was changed for one of a strong insistence for a subsidy for the local production.

Huffman, who was carrying the brunt of the load for the Mission in the negotiations with the seed companies, the Ministry and the Federconsorzi found himself faced with the difficult task of bringing effective leadership to a situation over which he had little administrative control. While ECA could influence the Ministry's course of action through the provision of advice and its agreement or disagreement on the use of counterpart funds, it was certainly not in a position to dictate to the Ministry. Action had to be secured through persuasion and cooperative agreement.

Huffman's efforts to develop a program for 1951 and to find a solution of the surplus seed problem with the Ministry took time. The Ministry was not prepared to embark on a promotional campaign for 1951 until the results of the 1950 season were known. While it favored a subsidy for the carryover seed, it was not sure that a subsidy should be extended to the local production.

^{49/} Some of the Agricultural Inspectors had proceeded cautiously on the hybrid corn movement. They wanted to make sure of the merits of hybrid corn before giving the program full support.

The subsidy question was a difficult one to resolve. Suppose a subsidy was granted on the local seed as well as on the carryover. How would it be used? It seemed to the Mission and the Ministry that if the private producers knew that a subsidy would be furnished and its amount, they might raise their asking price per quintal by something near the size of the subsidy itself.

The Mission was not keen about the idea of providing a subsidy for 1951. Counterpart funds available for agricultural purposes were running low. In its opinion, the use of the remaining funds for other agricultural purposes might be more productive. Furthermore, if subsidies were decided on for 1951, it meant that subsidies would have to be granted on locally produced seed as well as the carryover to be fair to the local seed companies. This would use most of the remaining funds.

The subsidy issue finally came to a head with the decision of the Ministry to ask Parliament for 250 million lire of counterpart funds for a subsidy on the carryover seed. The Ministry's decision soon came to the attention of the seed companies. Debe and his seed company associates immediately began to press the Mission to (1) stand up for the companies' rights, and (2) take steps to insure that the subsidy covered local production as well as the carryover supply. The pressure was extended to the ECA/Washington office. One company contacted the Washington headquarters and wanted to know what kind of support ECA was giving the companies in Italy.

The wires of inquiry from Washington's ECA office and the local protests of the seed companies tended to crystallize the thinking of the ECA special mission in Rome. It came to the conclusion that ECA must take a stand on subsidy support for all seed, home grown as well as carryover.

Having reached this decision, the Mission contacted the Ministry and an agreement to this effect was soon reached.

Other Aspects of the Subsidy Problem

Once an agreement had been reached, and the legislation changed granting a subsidy on local as well as the carryover seed, other questions required attention. What should be the amount of the subsidy? Should the subsidy on locally grown seed be the same as on the carryover seed? How should the subsidy be handled?

Finding the answers to these matters took considerable time. Some of the questions could be resolved at meetings of representatives of the Ministry, the Mission, the Federconsorzi, and the seed companies while others could not be. The establishment of prices, for instance, was the function of the Interministerial Price Committee. Its procedures were involved and time consuming. Each seed company, for instance, had to appear before the committee and present its production costs. Then the committee would deliberate and finally make its ruling.

One ruling of the committee upset the seed companies greatly. The price committee ruled that the government subsidy could not be paid directly to the seed companies with a resulting lowered price to farmers, but that it must be paid to the farmers who would have to pay the total price. But, the committee ruled, if the seed companies would agree to selling their seed through the Federconsorzi, this procedure could be avoided because the Federconsorzi was a semi-governmental instrument. The first alternative was not practical administratively.

Consequently, this action of the price committee forced the three companies to sell their seed through the Federconsorzi. They did not like this ruling but finally had to agree to it because there was no other alternative. Their objections stemmed from their desire to feature their own brands and to develop their own outlets. Also they were afraid that the Federconsorzi would sell the ECA carryover corn first.

The prices and subsidies as finally established were: 50/

<u>Seed Category</u>	<u>Total Unit Price (Lire)</u> (per quintal)	<u>Farmer Subsidy (Lire)</u> (per quintal)	<u>Farmer Unit Price (Lire)</u> (per quintal)
Local production	20,000	5,000	15,000
Carryover Seed (grain)	17,850	5,850	12,000
Carryover Seed (forage)	17,850	10,350	7,500

The Legal Question of Counterpart Funds

By early March 1951 the administrative problems appeared to have been solved. It had been a long drawn out struggle covering 5-6 months. It seemed to the ECA administrators that everything had happened that could possibly happen. ECA had wanted to have a strong promotional program underway by November of 1950. Now it was March 1951. It was certainly time to get the seeds into the hands of farmers, they thought. But they were destined to encounter one more administrative obstacle. It dealt with the legality of using counterpart funds for subsidy purposes on imported ECA corn.

The ECA Mission in Rome had requested permission to use 300 million lire of agricultural counterpart funds for hybrid corn experimentation and farmer subsidy purposes in late December of 1950. 51/

50/ "Italian Agriculture 1951. Annual report of Food and Agriculture Division, MSA, Rome, Italy, January 1952." P-38. The price committee acted only on the prices of the local production. Other prices were determined by the amount of subsidy and import prices. 1,000 lire is equivalent to \$1.60. A quintal is approximately 220 pounds.

51/ Fifty million lire for research and the balance for subsidy.

Approval had been granted by higher headquarters, and the Mission proceeded with its negotiations with the Ministry on the 1951 program.

On March 13, 1951 the Mission in Rome received word from Washington that approval to use the counterpart funds for subsidy on the carryover corn had been withdrawn. The objection was a legal one which prohibited the use of counterpart funds for the purchase of corn which was imported with ECA dollars. In other words, using counterpart funds to pay part of an end cost, or as a subsidy, on a commodity which in itself was generating counterpart was illegal.

This directive threw the Rome Mission into consternation. Conditional approval had already been given the Italian Government's plans for the use of the counterpart money for subsidy purposes. The government, in turn, had publicly informed farmers of the prices they were to pay. Parliament had approved a law earmarking the 300 million lire from ERP counterpart funds. Distribution of the corn seed was already under way. In short, it appeared that the dilemma created by Washington's withdrawal of approval for use of 300 million lire for hybrid corn subsidies could be solved only by the reply that it was impossible for the Mission to withdraw its approval at this late date. Any other course of action promised to bring great embarrassment to all.

The solution of the problem was found in a precedent set in 1949 when ECA/Washington had approved the use of counterpart funds for a subsidy on imported hybrid seed corn. ECA/Rome pointed out this precedent and the stage of development of the 1951 program to ECA/Washington. The Washington office agreed that it was impossible to reverse its position on use of counterpart funds for hybrid corn subsidy at this late hour.

The 1951 Spring Campaign

While the administrators had been wrestling with administrative problems, the technicians had been busy in making preparations for the 1951 campaign. Germann and Fenaroli had worked closely in developing a fine farmers' bulletin on hybrid corn. This was published and distributed through the joint auspices of the Ministry and the ECA Mission. ^{52/} Details of publicity and distribution had been carefully planned. Consequently, once the last administrative hurdles had been cleared, the promotional campaign was ready to go.

^{52/} 250,000 copies were widely distributed to farmers and farm leaders through the offices of the Provincial Inspectors. It should be mentioned that later in the year a second film on hybrid corn was developed and put into use. It featured hybrid corn developments in Italy.

Even though the campaign had made a late start, it was apparent by late May that the spring campaign was going over with success. The favorable results of the 1950 hybrid corn crop coupled with excellent educational and promotional work of the Ministry, the Federconsorzi, and the seed companies was bearing fruit. 53/ The hybrid seed corn supply was disappearing rapidly. The Ministry's action of setting a fairly high subsidy of 10,350 lire per quintal on a portion of the carryover seed for forage purposes gave an additional impetus to disposing the carryover. By late summer nearly 2,600 metric tons of the 2,950 tons of hybrid seed corn had been sold compared with 1,500 tons in 1950. The surplus hybrid seed corn problem had been solved, and in the eyes of the participants of the program the project was "back on the tracks and going ahead full steam." 54/

Results of the 1951 Season

By the close of the year the hybrid corn program was "over the hump and on firm ground" in the opinion of the Mission. Hybrid corn had satisfactorily demonstrated its superiority over most open-pollinated varieties planted by Italian farmers. Approximately one-twelfth of Italy's total corn acreage had been seeded to hybrids. The Ministry of Agriculture was estimating the 1952 farmer demand for hybrid seed corn at 3,000 - 3,200 tons. The quantity of local seed available for 1952 plantings was 2,800 tons.

The three seed companies had had a good season and were planning to expand their seed acreages in 1952. The Mission reported "while the companies have established a price of 22,000 lire per quintal (\$8.80 per bushel) for the top grade of seed, which means that farmers will have to pay 7,000 lire per quintal, more than they paid in 1951, there is every reason to believe that the total available seed supply will be sold. The past year's hybrid corn performance was excellent in most areas and farmers have been placing advance orders for over a month. Professor Fenaroli estimates that the 2,300 tons of hybrid seed planted for grain in 1951 increased the total corn yield in Italy by 100,000 tons. Part of the gain in 1951 may be credited to the planting of better quality seed, to the selection of more suitable hybrids in relation to soil and climatic conditions and to the following of more desirable

53/ Some observers report that an ECA strengthened agricultural advisory system (Extension Service) was now beginning to add its weight to the hybrid corn educational effort. Later on the prestige of the corn program, in turn, was to be of assistance in the furthering of the advisory system movement.

54/ According to the annual report of the Food and Agriculture Division January 1952, the following amounts were sold: Local production 14,695 quintals, carryover seed for grain 7,678, carryover seed for forage 2,516, and 1951 imports 930 quintals.

cultural practices such as thickness of planting and fertilizer applications. The value of the increase attributed to hybrids at present prices is 6.5 billion lire (\$10,400,000). 55/

The experimental phase of the program had also made good progress in 1951 under Professor Fenaroli's leadership. It had included:

1. Comparison tests of single crosses.
2. Tests of various combinations of single crosses and inbred strains including U. S. importations.
3. Identification and purification of selected, local, open-pollinated varieties.
4. Inbreeding of selected Italian open pollinated varieties for the purpose of developing flint-dent hybrid varieties.
5. Density of seeding early, medium and late maturing hybrid varieties.

Under ECA financing a second OEEC survey of progress in the cultivation of hybrid maize in European countries was conducted by two eminent corn specialists, Dr. G. F. Sprague (Senior Agronomist USDA, and Professor of Plant Breeding, Iowa State College) and Professor A. L. Lang (Professor of Soil Fertility, University of Illinois). They reported that the maize breeding program in Italy had developed in a very satisfactory manner but expressed some concern about the organizational arrangement.

"The local production of hybrid seed requires some form of organization to provide inspection service for certification and a separate organization to maintain stocks of the inbred lines in commercial use and to produce the necessary single crosses in the required amounts. At the present time these two functions are being performed on a limited scale by Mr. Fenaroli and his staff in addition to his regular breeding and testing program. Since the critical time for certification, seed production and inbreeding studies are identical, the present staff cannot continue to perform all three functions adequately. It is recommended that a special study be made of the problem and some provision made for:

1. "The establishment of an organization which will be responsible for all of the procedures required in the production of certified hybrid seed maize.

2. "A second organization be established to produce the necessary quantities of foundation single crosses. Both of these organizations should be closely associated with the work at Bergamo to insure the necessary integration and cooperation."

Thus came to a close ECA's active participation in the Italian hybrid corn movement. It felt that its general objective, that of aiding the introduction and furthering the spread of hybrid corn in Italy, had been reached. 56/

Developments in 1952

The developments in 1952 may be covered briefly. Three thousand tons of hybrid seed were sold to Italian farmers without the benefit of a government subsidy. 57/ While difficulties were being encountered in finding suitable hybrids for central and southern Italy, the rich Po Valley of northern Italy was rapidly becoming a hybrid corn producing area as the following figures illustrate. 58/

<u>Province</u>	<u>Percentage of Corn Land in Hybrids (1952)</u>
Cremona	80
Milano	70
Brescia	60
Torino	50
Pavia	50
Bergamo	50
Venito	25

It was estimated that 8.7 percent of the total maize area of the country had been planted to hybrids with a resulting increase in yield of 220,000 tons. The approximate value was 20 million dollars. Nearly five thousand tons of hybrid maize seed had been produced domestically. This seed was sufficient to expand the 1953 acreage of hybrid maize about 50 percent over that of 1952. 59/

Other important developments took place. While the Federconsorzi continued to market all of the hybrid seed corn at standard prices, there were signs that, as the companies gained strength and as the supplies of seed corn became more adequate to meet market needs, a system of direct contact between seed companies and seed purchasers would be worked out.

56/ There is one main exception. Germann was continued in his role of giving technical assistance.

57/ The Federconsorzi reports that only 15 tons of this amount were imported in 1952.

58/ Estimates by seed companies.

59/ Merle T. Jenkins' "Present Status of Hybrid Maize in Europe and the Mediterranean Region." March 23, 1953. Dr. Jenkins then was serving as Hybrid Corn Specialist for MSA, attached to the European Regional Office in Paris.

A change in the functions of Professor Fenaroli also took place. In the past he had engaged in commercial production on a small scale: (1) To determine the actual costs of production; and (2) to check on the quality of seeds being sold to farmers. This work had been done to safeguard the public from possible abuses of the seed companies. During 1952 this phase of the work at the Bergamo station was turned over to the Federconsorzi. 60/ In the eyes of many observers this shift in functions is a good thing; some had felt that the Bergamo station was trying to do too many things.

Another development that promises much for the future of the Italian hybrid corn industry involves certification of seed. While steps had been taken in earlier years to establish certification procedures, the system had not been placed on a firm footing until 1952. The Iowa state law has been adopted in large measure.

The final development of considerable significance has been the establishment and use of a committee in promoting the use of hybrid corn in Italy. This committee chaired by Professor Fenaroli and composed of two representatives from each seed company and from the Federconsorzi meets periodically to coordinate the actions of the various parties in the hybrid corn field.

Challenges of the Future

While Italy has made rapid progress in the utilization of hybrid corn, there is general recognition that several problems exist which require attention. There is common agreement, for instance, that the number one technical problem is the research one of developing hybrids for the drier sections of Central and South Italy. In general, the American hybrids have not been suited to these areas. There is also need to develop better varieties for parts of the Po Valley. 61/ The seed companies, as well as the government experiment stations, are working industriously on this problem.

60/ Despite a gentlemen's agreement between the Federconsorzi and the three seed companies that the Federconsorzi will not grow more than 10 percent of the seed requirement, there exists considerable worry among the personnel of the seed companies on this development. They feel that the Federconsorzi, due to its great size, might give them tremendous competition if it should decide to expand in the seed production field.

61/ The breeding of hybrids more closely adapted to conditions in Europe, especially for dry-land cultivation in the more southerly areas where available North American hybrids do not perform satisfactorily, will be accelerated by the program for the cooperative testing and exchange of locally developed inbred lines initiated by FAO in 1952. (See reports of the Fifth, Sixth and Seventh FAO Hybrid Maize Meetings, 1952, 1953 and 1954).

Observers also report that the insect problem of controlling the European corn borer is a serious one and one that merits close attention.

A third problem of major importance deals with people and customs and getting people to accept new ways. 62/ It may be illustrated by developments in the Po River Valley. The acceptance of hybrid corn in the Veneto area of the Valley has been slow in comparison with the Lombardy area. In the first instance, about 6 or 7 percent of the corn acreage is now in hybrid corn, while in the Lombardy region approximately 85 percent of the corn acreage is now planted to hybrids. There are a number of factors accounting for this difference, but one of the main ones deals with the use of corn and customs in eating habits. In the Milan and Brescia areas, the upper part of the Valley, 90 percent of the corn goes for livestock feeding. In the Veneto area the situation is entirely reversed with 90 percent of the corn being used for human consumption, most of it being used to make the Italian dish, "polenta". The Italians in this part of the Valley feel that their native corn makes a better tasting and textured "polenta" than does the use of the hybrid corn. Impartial observers are not sure that there is any difference; they feel that there is a real need for research in this area. Nevertheless, the fact remains that the vast majority of the people have such a belief; and it is the opinion of competent observers that the spread of hybrid corn in this area will continue at a slow rate until this belief can be dispelled. 63/

A fourth area that may require attention is the distribution system. As indicated earlier, all of the hybrid seed corn in Italy is marketed through the Federconsorzi at standard prices. This means that the individual seed companies do not have direct contact with seed purchasers. Some observers believe that this is a serious weakness in the system, but one that may correct itself with time. 64/

62/ Huffman reports that the Americans did not fully understand and appreciate for some time the factor of local resistance to accepting something new. They knew that hybrid corn was a good thing. Why was it then that some of the farmers and agricultural inspectors held back? Only with time did they come to understand what tradition, poverty, and literacy meant in the innovation process.

63/ Other reasons given for this difference in acceptance of hybrid corn include: (1) The farms in the Veneto region are much smaller than in the Lombardy area, and therefore the farmers are more conservative. It has been noted that hybrid corn was accepted by the larger commercial farmers first and then later by the smaller growers; (2) there is not as much difference in yields of hybrids and native varieties in the Veneto region; and (3) the influence of the Bergamo corn station and the three seed companies has not been as great in the Veneto area because of a distance factor.

64/ "Present Status of Hybrid Maize in Europe and the Mediterranean Region" Op. Cit. P. 5.

Retrospect

The people who have participated in this program are proud of what they have accomplished. In a period of 7 years (1946-1952) - from the time of the introduction of hybrid seed through 1952 - its use has been widely accepted in Italy. Starting from scratch in 1945 the promoters of the program had succeeded in securing its use on more than 8 percent of Italy's corn land by the fall of 1952. 65/ The increased contribution to the corn crop in 1952 alone was 220,000 tons, worth 20 million dollars. 66/ Why has this program been so successful? Granting that some mistakes were made in the conduct of the program, what should be done differently if the program were to be repeated under similar conditions?

It is interesting to note that there is close agreement among the personnel of the Ministry, the Mission, the Federconsorzi and the seed companies on the reasons for the success of the program, and likewise on those matters which would be handled differently if the program were to be repeated.

The more important reasons given for the success of the program include:

1. The knowledge of the excellent performance of hybrid corn in the United States, and the strong belief among top Italian and American officials alike that hybrid corn should do equally as well in Italy. It seemed to them that there was no over-riding reason why hybrid corn could not be introduced into Italy. They felt that hybrid corn would sell itself once a farmer could see a demonstration comparing the hybrid and the native corn.
2. Once introduced, the excellent performance of American hybrid corn in many areas of Italy, particularly the Po Valley. In other words, the great difference in yield of the hybrid over the native corn.
3. The quality and thoroughness of the educational program - exhibits, demonstrations, bulletins, films and general publicity.

65/ It is impossible to make fruitful comparisons with its spread in the United States because of the differences in conditions and factors that were involved. Nevertheless, it is interesting to note that if we accept 1949 as the first year of any appreciable planting of hybrids in Italy, and 1933 in the United States that the relative rates of spread by the close of the fourth year were 8.7 percent and 3.1 percent respectively.

66/ Later information submitted to the Seventh FAO Hybrid Maize Meeting shows that in 1953 15.5% of Italy's corn land was under hybrids, giving an increased production estimated at 300,000 metric tons of grain beyond that which would have been obtained from the use of open-pollinated varieties on the same land area. Domestic production of hybrid seed had also risen from 5000 tons in 1952 to 10,000 tons in 1953, of which 2,800 tons was of open pedigree hybrids and 7,200 tons of closed pedigree hybrid.

4. The use of a subsidy. 67/

5. The technical assistance rendered by the Ministry, UNRRA, FAO, ECA Federconsorzi, seed companies and others. For instance, the sending of Italian technicians to the United States for training, both by ECA and the seed companies, and the use of Dr. Jenkins in Italy. 68/ Likewise, the technical follow through given to the conduct of the program by Fenaroli, Germann and others.

6. The promotional and research efforts of the three competitive seed companies. In this connection ECA's guarantee on investments of the seed companies.

7. The support of the Federconsorzi and other farm organizations.

8. The faith of Fenaroli in hybrid corn, and his leadership and work in promoting the program.

9. ECA's strong support of the program, and the desire of the Italians to take advantage of American technology. 69/

10. The salesmanship of one farmer to another once the hybrid corn had been tried. 70/

If this program were to be repeated under similar conditions, what should be done differently? The participants in the program say that they would not make many changes. However, they feel that:

67/ There is a slight disagreement on this point. A few observers maintain that it should not have been used after the first year. Other observers feel that its use during 1949, 1950 and 1951 doubled the rate of acceptance of hybrid corn by Italian farmers.

68/ Dr. Jenkins participated in the first OEEC Hybrid Corn Survey Mission in 1949 and later spent 12 months in Europe as Hybrid Maize Adviser to MSA, with headquarters in Paris, from April 1952. In addition Dr. Jenkins has participated in all but one of the seven annual FAO Hybrid Maize Meetings in Europe, as Technical Consultant to FAO. His participation in both OEEC and FAO activities in this field has done much to assist these agencies in coordinating the development of their respective programs and avoiding duplication.

69/ This desire of the Italians rested, in large measure, upon the underlying relationships existing between the people of Italy and the United States, i.e. the inherent friendly attitude of the Italians for the Americans and vice versa.

70/ There is considerable difference of opinion regarding the effect and importance of the distribution of the 300 tons of free hybrid corn by the church. Many observers feel that this distribution played a substantial part in promoting the spread of hybrid corn among small farmers. Other observers tend to discount the overall value of this contribution.

1. The propaganda issued by the Ministry and ECA in 1949 on the 1947 and 1948 results tended to be too broad and general in relation to the actual experience in Italy. They say that the tests in 1947 and 1948 gave adequate information to generalize for some areas of Italy, but not for others. Consequently, the tendency to over generalize resulted in inaccuracies in the information given to farmers.

2. A policy should have been established on the use of the subsidy in the beginning which would have given increasing farmer prices on the sale of the hybrid seed to farmers. 71/

3. The decision to jump from a 50 ton demonstrational program in 1948 to a 2,000 ton importation in 1949 involved too much risk. If the program were to be repeated under similar conditions, they would favor a more moderate approach. 72/

4. Not enough attention was given to educating Agricultural Inspectors on the characteristics and uses of hybrid corn in 1948 and 1949. 73/

What is the outlook for the future of hybrid corn in Italy? The answer is good. There is general agreement among the participants of this program that 75-80 percent of the corn land in the Po Valley will shortly be in hybrid corn. The future of hybrid corn for Central and South Italy is harder to predict. It is still in the hands of the research workers. If they succeed in developing suitable varieties for these regions, and there is every expectation that they will, then indeed Mc Clelland's vision on what hybrid corn can do for Italy will come true. 74/

71/ Cottam and Tetro are not in complete agreement with other participants on this point. They feel that the establishment of a fixed policy such as this in the beginning was impossible due to the dynamic nature of the situation. In their opinion, a changing subsidy policy was inevitable because of the rapidly changing conditions.

72/ This is not a clear cut conclusion. There are a few participants who feel that the decision was not too risky. Huffman, for instance, takes this position.

73/ Other changes of a more minor nature include: (1) the certification program should have been started earlier; (2) it would have been better for Fenaroli not to have engaged in commercial production.

74/ There is one exception to this statement. Close observers of the program feel that Mc Clelland was probably wrong in his belief that Italy would develop into a great hybrid seed corn exporting country. Nevertheless Professor Fenaroli reported to the Seventh FAO Hybrid Maize Meeting in February 1954 that about 20% of the 10,000 metric tons of the hybrid maize seed produced in Italy in 1953 might be available for export.

Appendix A

Explanation of Counterpart Funds

Counterpart funds exist only because there is an European Recovery (E.R.P.). The counterpart fund is in lires, and arises as a result of imports from the United States. The funds arise as follows:

- a. Italian consumers pay for the commodities that they buy which have been imported in raw or processed form.
- b. Retailers, wholesalers and processors who handle these commodities also pay for the commodities in the regular way, but
- c. The importer of the commodities does not pay the United States in dollars. The payment for the commodities exported (from the U. S.) is made out of Economic Cooperation Administration (E.C.A.) funds. However, the Italian importer must pay lires for the commodities imported in an amount equivalent to the dollar value of the commodities imported. The accumulation of these lire payments for imported goods constitute the "Counterpart Fund".

Counterpart funds are used in the economic rehabilitation and reorientation of Western Europe. All counterpart funds released by the U. S. to the Italian Republic are considered public funds within the scope of the Italian national investment program. The money is allocated to specific projects which must have joint approval of E. C. A. and Italy. The funds are applied in two ways:

- a. On a loan basis - credits for agricultural and non-agricultural activities.
- b. On a "grants-in-aid" basis. This is to be a special allocation to projects where there is limited or no possibility for repayment, such as funds applied to research, education and advisory work.

Appendix B

COMMENTS BY RALPH F. GERMANN

The introduction and spread of hybrid corn was the most important research, promotional and extension program carried out in Italy in the post war period.

The program was successful because it was economically and technically sound. The spirit of wholehearted cooperation which was achieved between Americans and Italians interested in the program was an outstanding development of this project and assured the quick technical success of the program.

The spirit of cooperation still remains. The benefits of this cooperation will be felt in the future in all corn producing areas. It is well to mention that the first postwar European production program sponsored by F.A.O. was the hybrid corn meeting at Bergamo, Italy. The hybrid corn program has been supported by Allied Military Government, U.N.R.R.A., F.A.O., O.E.E.C., E.C.A., M.S.A., F.O.A., and USDA.

The Italian hybrid corn program is expanding rapidly, and each year sees greater economic and technical progress. Starting in 1945, as was pointed out, with no one in Italy having first hand information about the great hybrid corn development in the United States, and secondly, knowing for certain whether American hybrid varieties were suitable, the program was launched. During the following years the promotional programs were designed to gain the support of the Italian farmers, the Ministry of Agriculture, the experimental stations, the agricultural universities, the corn seed merchants, the farm press and radio in developing a complete hybrid corn program. This support for the program has been largely achieved.

In looking back at the four years that I worked as a technical advisor to the Italian Ministry of Agriculture under the E.C.A. and M.S.A. technical assistance programs, I feel that my most valuable contribution besides giving sound technical advice and suggestions was the development of confidence, strong leadership and a spirit of technical cooperation. The principle followed in the hybrid corn project of developing a coordinated research and extension program is being used in Italy in other production programs.

More Italian farmers are benefiting from the introduction and spread of hybrid corn than any other project sponsored by E.C.A., M.S.A., and F.O.A. in Italy. The total cost in dollars in getting the program underway for the imported hybrid corn seed and the subsidy to encourage its sale was very modest.

